Formal Language Theory in Linguistics
Syllabus for 2021 Fall

1 General Information

LECTURE: Tuesdays   14:15 – 16:00   PAM Seminarroom 9
COURSE WEBSITE: https://www.uio.no/studier/emner/hf/iln/LING4170/h21/index.html

INSTRUCTOR: Mai Ha Vu (she/her/her)
OFFICE: HW 324
E-MAIL: m.h.vu@iln.uio.no
OFFICE HOURS: Mondays and Thursdays 14:00-15:00, or other times by appointment

2 Course Description

This course aims to teach students about the Chomsky Hierarchy and its application to natural language. It is a course for helping linguistics students understand natural language as something computable, describable in mathematical and computational terms; and place natural language grammars within the broader set of all possible grammars. The course covers regular languages and context-free languages in depth, and also introduces subregular languages. We will also read artificial language learning experiments that are informed by this perspective. In the end of the course, students should have a good understanding about the various formalisms used in formal language theory (grammars, automata, logic) and be able to read and understand primary sources on the topic. In addition to the readings list, students will choose one article for their syllabus. More information on this will be given when the course starts.

3 Course Materials

You can access the required readings through Leganto:
https://www.uio.no/english/services/it/education/leganto/
The schedule of readings is listed on the course website, Canvas, and below. Please follow Announcements on Canvas for any change.

4 Class policies

- **Readings**: This is a highly technical course. You might not be able to completely follow all the readings, but please try to read them in advance and come prepared with questions. Much of in-class time will be devoted to walking through the readings.
- **Participation**: Good participation means regular attendance and participation in class discussions. I will take attendance for infection tracking reasons.
- **Handouts**: Most instruction will be through handouts and working problems out on the whiteboard. Handouts will be posted on Canvas.
- **Office hours**: I will hold weekly office hours, which are times when you can drop in and discuss anything that I can help you with. Additionally, feel free to e-mail me for appointments.
- **Electronics**: You can use laptops or tablets during class. All electronic devices must be silenced.
- **Accommodations**: I try to do the best to be accommodating for various student needs. If there is anything I can do to help you with learning, do not hesitate to reach out to me.

5   Assessment

Your final grade will be based on a portfolio of 4 assignments (mappeeksamen). Each assignment will be 3-4 pages long, together they will be no longer than 15 pages long.

Detailed instructions for all four assignments will be available on Canvas in the first week of class. You must submit all components of your portfolio by **December 3, 2021 11:00**.

Summary of the 4 assignments:

1. Practice regular language formalisms
2. Practice context-free language formalisms
3. Describe a linguistic pattern with model-theoretic formalism and with another formalism of your choice
4. Summarize and evaluate a formal language theory paper (e.g. the ones listed under Optional Readings)

General advice on the assignments:

- You may seek feedback from me on any of the assignments at any point during the semester, and continue working on it until the final submission date.
- I suggest that you complete the assignment for each topic in the week after we are done with the topic.
- Many assignments will involve complex mathematical symbols and drawings. I advise that you use LaTeX to write your assignments, but I accept other solutions too, including handwritten ones.
- Please submit all your assignments in pdf format to ensure compatibility.

6   Schedule

Schedule is tentative and will be updated during the semester. Check Canvas for all updates.

Dates	Topic	Readings
24/08	Introduction	Heinz & Idsardi (2011), Jäger & Rogers (2012):1
31/08	Regular expressions, FSAs, FSTs	Heinz (2019)
07/09	Model theory: string models	Heinz & Rogers (2019)
14/09	Model theory: string models	
21/09	NO LECTURE	
28/09	CFGs, automata	Jäger & Rogers(2012):2, Graf (2014), Graf (2016):3.2.1-3.2.2
05/10	NO LECTURE	
12/10	Constraints on tree models	Graf (2016):2.2
19/10	Subregular string languages	Jäger & Rogers (2012):6, Graf (2019a):5
26/10	Subregular tree languages	Graf (2019b)
02/11	NO LECTURE	
09/11	Artificial language learning	Lai (2015), Avcu & Hestvik (2020)
16/11	Wrap-up	Jäger & Rogers (2012)